PRACE GEOGRAFICZNE, zeszyt 114

Instytut Geografii i Gospodarki Przestrzennej UJ
Kraków 2004

Arkadiusz Kołoś

THE URBAN RAIL TRANSPORT AS AN ELEMENT OF THE URBAN QUALITY OF LIFE IN POLAND

Abstract: One half of Poland's urban traffic continues to be handled by public transport systems. The author looks at the various aspects of urban rail transport (URT) as important contributors to the standard and quality of urban life. These aspects include URT route accessibility, network utilisation, service frequency, capacity and operating speed

Keywords: public transport, accessibility, network shape, service frequency, capacity, operating speed.

1. Introduction

There are two main categories of means of transport used for urban people traffic:

– individual transport; including single-track vehicles (mainly bicycles) and two-track vehicles (personal cars); and
– public transport; including buses, trolleybuses and URT (tram, underground, fast urban rail).

The urban public transport system has a dual role, as:

– a form of social assistance for those who cannot operate the individual means of transport, such as children and the handicapped, or are not able / cannot afford to do so, such as those suffering from illnesses or the poor;
– a less expensive means of transportation due to lower energy consumption and lower external costs (particularly lower demand for space).

Public transport systems, of which URT is part, are intended primarily to improve access within an urban area, but also to meet the inhabitants' travelling needs. These needs depend on:

– the size of the city (population, square area and the outline shape);
– the town's spatial and functional structure, especially the location of residential areas versus other functions.
– the town's demographic structure. (Meyer 1998)

In this research, the travel structure broken down by means of transport was used to determine the impact of URT on the urban quality of life. Table 1 presents sample data from various towns and urban areas. There are two types of such structures identified in well-developed countries (see Rudnicki 1994):

– absolute domination of the individual transport over the public transport, the latter accounting for between a single digit and 20% of the overall traffic (e.g. Los Angeles);
– considerable share of the public system (30-50%). This system is a result of a consistent transport policy aimed to develop public transport system and restricting car traffic. Consequently, the use of cars dropped in favour of the public system and bicycles (e.g. Munich). This policy is typically pursued in large cities with greatest congestion issues.

In Poland, contrary to Western Europe and North America, the share of public transport in overall urban passenger traffic remains high. It has dropped in comparison to the levels of 1980s, but still accounts for up to 70% of that the overall non-pedestrian traffic, with the car representing between 30-50%. The share of URT (where available) in overall public transport travels stands at ca 1/3[1] . In 1996, tramways accounted for 22.9% of all public transport travel, the underground for 0.5% and buses for 76.6% (for all towns with public transport in Poland) (Wyszomirski 1998). Bicycle accounted for a very minor share.

Tab. 1. Travel breakdown by mode of transport in selected cities in Poland and worldwide (in percentages)

Tab. 1. Struktura podróży wg środków transportu, w wybranych miastach lub zespołach miast świata (w procentach)

Mode of transport			Warsaw		Cracow		Katowice	Siemia nowice Śląskie	San Francisco (city)	Los Angeles (city)	Munich		The Ruhr Area	
			1980	1993	1985	1994	1998		1990		1976	1995	1976	1996
On foot			30.0	.	.	.	37.6	42.9	.	.	31.0	23.0	38.0	25.0
Carrier	Total		70.0				62.4	57.1			69.0	77.0	62.0	75.0
	Incl	Car	12.5	30.6	15.0	27.9	46.2	43.3	55.0	93.0	60.9	49.4	65.6	69.3
		Bicycle	.	1.4	.	1.8	0.3	0.2	.	.	11.6	18.2	9.8	10.7
		Bus	87.5	68.0	85.0	70.3	36.6	50.3	45.0	7.0	27.5	32.4	24.6	20.0
		Tram					15.6	6.2		–				
		Urban Rail			–	–	1.3	0.0		–				
		Metro	–		–	–	–	–	–	–			–	–
Source:			R	Z	R	Z	K	K	R	R	P	P	P	P

Source: *Kompleksowe badania* ...1999 (K); Pucher 1998 (P); Rozkwitalska 1997 (Z); Rudnicki 1994.

[1] Estimate based on available data (Wyszomirski, 1998) and railcar mileage (*Komunikacja* ..., *2000*).

The project looked into the various aspects of URT by analysing the conditions and quality of the service aimed to improve its availability. The quality of travel was measured for the various aspects of the transport service standard (such as punctuality, regularity). During 1990s, most of Polish cities began such measurements, but using different methodologies. A review of these methodologies is presented in *Metody oceny i kontroli funkcjonowania komunikacji zbiorowej* (1996). A critical review of the methodologies, complete with proposed comprehensive and clear assessments of the quality of public transport is featured in *Jakość komunikacji miejskiej* (Rudnicki 1999). The above mentioned differences between the measurement methods have made a city-by-city analysis impossible. It was only possible to estimate that public transport in large Polish cities was rated "good", with lower scores for aspects such as "punctuality", "regularity". That could be attributed by the growing congestion of Polish city streets.

The paper aims to present an analysis of the various URT aspects in Poland in the context of their influence on the quality of life. The study covered all towns and cities where this mode of transport was available and was based on statistical data from local public transport companies, the local authorities and on other information collected by the author in the field during 1999-2001. The data and detailed description of its processing is presented in the Annexe to the author's doctoral thesis (Kołoś 2001).

The detailed analysis covered:

- the availability of URT (from rail stop to residence or work (or other destinations) and network utilisation;
- the frequency and capacity of service;
- the operating speed.

2. Availability and network utilisation

The simplest indicators to assess availability of a URT network include a widely used network density ratio and the ratio of network length per 1000 inhabitants proposed by the author in his doctoral thesis (Kołoś 2001). An indirect method to assess network utilisation would be the ratio of the number of lines to the average line length (Tab. 2).

The values shown in Table 2 increase with the growth of population. This is explained by the fact that URT is the cheapest and most efficient in large cities. Large cities, therefore, tend to have the best-developed URT systems and consequently such systems are the best accessible and their patterns are the best suited to meet most of the travel demand.

The detailed analysis uses the case of the city of Cracow. Figure 1 presents the tram network against the background of population density, broken down by neighbourhood, thus providing a picture of tram accessibility with the assumption of a 700 m distance from the line as its range of influence.

Generally, the tram network accessibility area covered neighbourhoods with the population density above 2000 persons per sq. kilometre (Fig. 2). This pattern was well justified, because a lower population density would not ensure the minimum passenger flows. Nevertheless, there existed high-density areas left outside the accessibility bands, including high-rise housing estates of the "northern belt"

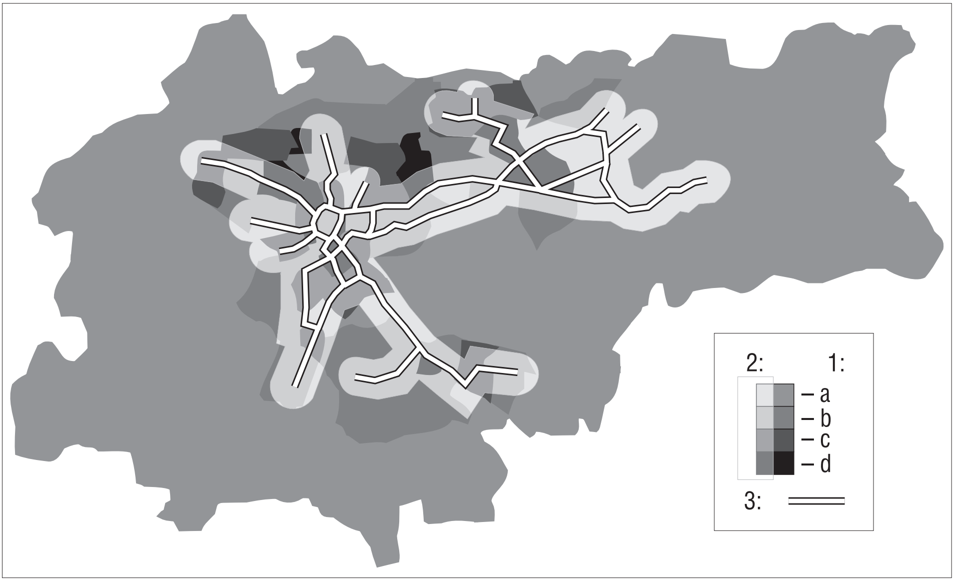


Photo by A. Kołoś

Tab. 2. Accessibility and utilisation of URT

Tab. 2. Wskaźniki opisujące dostępność do sieci MTS oraz jej wykorzystanie

City or urban area		Network length (metres per 1000 inhabitants)	Network density (km per 100 km^2)	No of lines	Mean line length (km)
Grudziądz	Population ↓	*91.7*	*16.0*	*2*	*6,2*
Gorzów Wlkp.		*95.3*	*15.6*	*3*	*8,2*
Elbląg		*91.2*	*14.8*	*3*	*6,9*
Toruń		103.8	*18.4*	*4*	*10,4*
Częstochowa		*44.4*	*7.1*	*1*	*10,4*
Bydgoszcz		*75.7*	*16.8*	*8*	*9,0*
Szczecin		115.3	*16.0*	*12*	*8,2*
Poznań		106.9	23.6	16	11,7
Wrocław		134.9	29.3	23	12,3
Cracow		*97.7*	22.1	23	12,4
Trójmiasto*		108.6	*19.8*	*11*	13,1
Łódź		140.4	32.0	28	13,4
Warsaw		*80.9*	26.4	35	14,4
GOP		108.5	20.7	29	12,5
Mean		*Smaller* < 99,7 < larger	*s* < 19.9 < l	*s* < 14 < l	*s* < 10.6 < l

* Trójmiasto, i.e. Gdańsk, Sopot and Gdynia

Source: own study based on various data (Kołoś A. 2001) and on *Rocznik Stat. Województw* 2000.

(Azory, Prądnik Biały Wsch., Górka Narodowa, Żabiniec, Prądnik Czerwony, Olsza II, Ugorek, Dywizjonu 303) and residential estates located to the southwest of the centre of the Ruczaj Zaborze housing estate.The latter accessibility gap includes the 3rd Campus of the Jagiellonian University, currently under construction, and the nearby special economic zone. Other areas not served by the Cracow trams included the industrial

---

Fig. 1. Accessibility of tram network and population density in Cracow

Ryc. 1. Dostępność do sieci tramwajowej w Krakowie na tle gęstości zaludnienia

1. Population density (population/km^2) 1997: a. <2000; b. 2000-8000; c. 8000-16000; d. >16000; 2. Tram line influence range (700 m); 3. tram lines

1. Gęstość zaludnienia (liczba ludności/km^2) 1997: a. <2000; b. 2000-8000; c.8000-16000; d.>16000; 2. Zasięg oddziaływania linii tramwajowej (700 m); 3. trasy tramwajowe

Source: Kołoś A. 2001, p. 89.

Fig. 2. The junction of the two most tram-intensive streets in Poland: the „Centrum" tram stop at the junction of al. Jerozolimskie and ul. Marszałkowska in Warsaw. (Metro entrance in lower left corner).

Ryc. 2. Skrzyżowanie dwóch najbardziej obciążonych tras tramwajowych w Polsce: przystanek „Centrum" na skrzyżowaniu al. Jerozolimskich i ul. Marszałkowskiej w Warszawie; (w lewym, dolnym rogu wejście do stacji metra).

Tab. 3. Urban neighbourhoods and other important facilities not served by a URT
Tab. 3. Dzielnice i niektóre ważne obiekty w miastach Polski pozbawione dostępu do MTS

City/town	Neighbourhoods and housing estates (densely Populated) without URT access	Other important facilities not accessible by URT
Bydgoszcz	Osowa Góra, os. Błonie, Szwederowo, Brdyujście, Fordon (osiedla: Przylesie, Bohaterów, Bajka, Nad Wisłą, Tatr Zańskie, Niepodległości),	Railway station, Cancer Hospital
Częstochowa	Parkitka, Wrzosowiak, Błeszno, Raków, Zawodzie, centre (western),	Jasna Góra Monastery (national shrine)
Elbląg	os. Na Stoku, os. Zakrzewo, os. Nad Jarem,	–
Gdańsk	Orunia, "Górny Taras" (Górna Orunia, Chełm, Suchanino, Piecki, Migowo),	Port Północny Harbour, Rafineria Gdańska Refinery, Rębiechowo Ariport
Gorzów Wlkp.	os. Staszica, os. Zacisze, os. Chemik, Zamoście – Zakanale,	–
Grudziądz	os. Lotnisko, Mniszek,	–
Katowice	Giszowiec, Ligota, Bogucice, Janów, os. Witosa, os. Paderewskiego, os. Józefowiec (western),	Institutions along al. Górnośląska, Central Univ. Hospital in Panewniki,
Łódź	Żabieniec (northern), Teofilów (southern), os. Radogoszcz-Wsch., Olechów, Augustów,	Central Mother Hospital (Centrum Zdrowia Matki Polki), Lung Hospitals at Łagiewniki,
Poznań	os. Umultowo, os. Wł. Łokietka, os. Marysieńki, os. Popiełuszki, Raszyn, os. Kopernika (southeastern),	University (Umultowo), Ławica Airport,
Szczecin	Glinki – Skolwin, os. Arkońskie, os. Kaliny, os. Przyjaźni, Żelechowa, (os. Bandurskiego, os. Książąt Pomorskich), Dąbie (os. Słoneczne, os. Majowe, os. Bukowe),	University (ul. Cukrowa),
Toruń	Podgórz, os. Koniuchy - os. Wrzosy,	University (Bielany), Railway Station
Warsaw	Chomiczówka, Ruda, Tarchomin, Bródno-Podgrodzie, Targówek, Saska Kępa, Gocław, Czerniaków – Sadyba – Wilanów,	Central Child Hospital (Centrum Zdrowia Dziecka), University and other org. near Krakowskie. Przedmieście, Parliament, Okęcie Airport,
Wrocław	Maślice, os. Kozanów, os. Nowy Dwór (tab. 23), Psie Pole (os. Zakrzów, os. Zgorzelisko), os. Gaj, Karłowice,	Strachowice Airport

Source: own study based on city maps.

and storage areas of Płaszłow and Łęg, as well as the vast grounds of the Sendzimira Steelworks (albeit having its own internal system of transport). Also, the Cracow Balice airport was out of URT reach.

Thus, the Cracow's relatively well-developed tram network featured some non-served areas - mainly the areas developed after 1970. A similar situation was also true about most of Polish cities with a URT, as summarised in Table 3.

3. Frequency and capacity of service

Another important aspect of a URT is its service frequency and capacity. The average values of these parameters are shown in Table 4.

The average URT service frequency ranged from one service per 9.5 to 15.4 minutes (i.e. 3.9 to 6.3 services per hour). The actual frequency per given stretch of the network was higher, as normally more than one service used the same stretch of tracks. The only exception was the city of Częstochowa where the high average frequency was a result of there being just one line. The average frequency of services measured for several services running on a common route numbered more than a dozen. The highest frequency of services, at ca. 40 trams per hour (nearly the technical ceiling frequency) was recorded in large city centres: at al. Jerozolimskie (46 trams/hr) and ul. Marszałkowska (44) in Warsaw (Fig. 2), ul. Roosevelta in Poznań (45) and ul. Basztowa in Cracow (42).

Tab. 4. Mean URT service frequency and capacity

Tab. 4. Średnia częstotliwość i zdolność przewozowa w MTS

City/town		Mean frequency (intervals in minutes)	Mean capacity (weighted by line length) (passengers / peak hour)
Grudziądz	Population ↓	*14.0*	*927*
Gorzów Wlkp.		10.0	*906*
Elbląg		*15.0*	*578*
Toruń		*14.3*	*733*
Częstochowa		4.2	2330
Bydgoszcz		11.5	*808*
Szczecin		9.5	*1005*
Poznań		11.0	*869*
Wrocław		12.0	*766*
Cracow		*14.8*	*779*
Trójmiasto		*14.8*	2375
Łódź		*15.4*	*688*
Warsaw		*13.5*	1096
GOP		*17.1*	*528*
Mean		Higher < 12.6 < *lower*	*l* < 1028 < h

Source: own study based on various data (Kołoś A. 2001).

The lowest frequency was normally measured on suburban lines (often single-track) within low-rise residential areas of large cities (Warsaw – towards Boernerowo (2.5); Wrocław – towards Klecina (5)) or in smaller towns (Grudziądz – towards the railway station; Toruń – at ul. Uniwersytecka and Wschodnia (3 each); Elbląg – towards ul. Marymoncka and ul. Saperów (4 each)). Also, the out-of-town lines in Łódź featured low frequency (the Lutomiersk service No 43 recorded 1 tram per hour), as well as most of lines in the Upper Silesian region (the Wojkowice line No 25 was the lowest at 2 trams per hour).

The highest mean capacity was recorded in Częstochowa and in Gdańsk (above 2000). In Częstochowa, the high capacity was caused by the fact that there was just one route, while in Gdańsk the figure was boosted by the SKM urban railway system running between Gdańsk and Gdynia-Cisowa at the capacity of 8000 passengers per hour. The highest capacities were also measured in city centres, while the lowest values were recorded along the terminal stretches of suburban lines (similar to frequency), and along certain ring lines linking larger city areas.

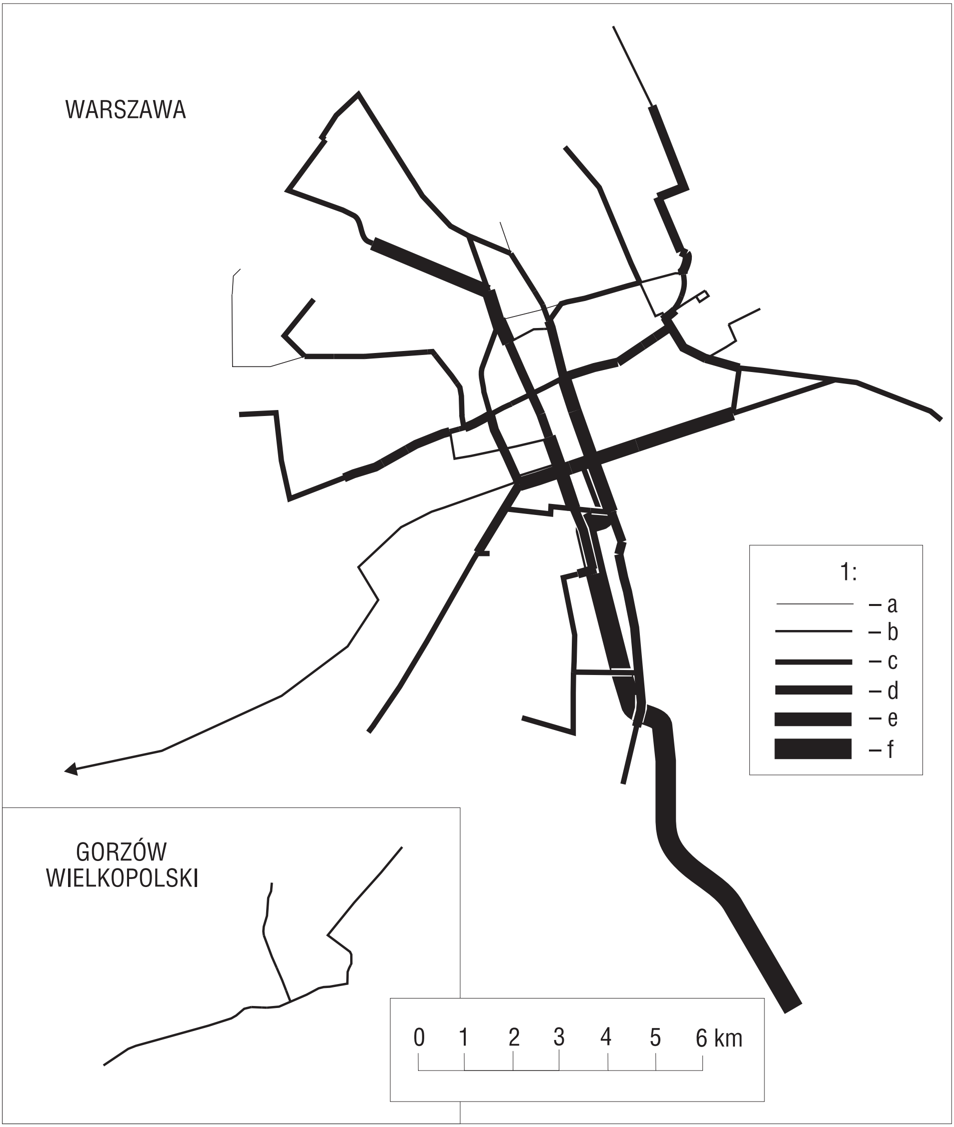
In large cities, most of lines were measured between 2000 and 6000 passenger per hour (Fig. 3). In smaller towns, the capacity did not exceed 4000 even in town centres and typically stood at between 1000-2000. The lowest capacity was recorded in Upper Silesia where the figures seldom exceeded 1000 passengers per hour. In this region, only the lines connecting nearby towns or serving town centres had higher capacity (1000-1500).

4. Operating speed

The actual speed of public transport vehicle is one of the most significant aspect of accessibility. The speed reviewed in this research depended on the technical maximum speed allowed for the particular URT vehicle (currently close to that of a car). It also depended on the number of stops and the time required to allow for passenger alighting and boarding at each stop, as well as on any other stops and speed reductions necessary as a result of traffic organisation and obstacles, typically caused road congestion.

Operating speed is also significantly influenced by the location of the tracks vis-ŕ-vis the road (Fig. 4). In Cracow, the trams sharing the streets with the car traffic operated at the average speed of 15.6 km per hour and the maximum speed of 17.9 km per hour. However, the trams using tracks separated from the road reached 22.3 and 23.3 km per hour, respectively. The shared/separate track type was a feature strongly correlated with the age of the line, as most of street tracks had been constructed before the Second World War.

The average operating speed and the proportion of separated tracks in the overall network length is shown in Table 5. The highest speeds were recorded in those cities where the proportion of separated to street tracks was greatest. This overall pattern was further qualified by the single-track lines where the lower operating speeds were a result of the specific traffic organisation. This condition was particularly important in the city of Elbląg and in the Upper Silesian towns. In Warsaw, the relatively low operating speed despite a large number of separated-track lines was a result of high intensity of tram traffic (Fig. 4), and poor traffic organisation. The Warsaw tram network had suffered years underdevelopment as a result of an overly optimistic view of the prospects



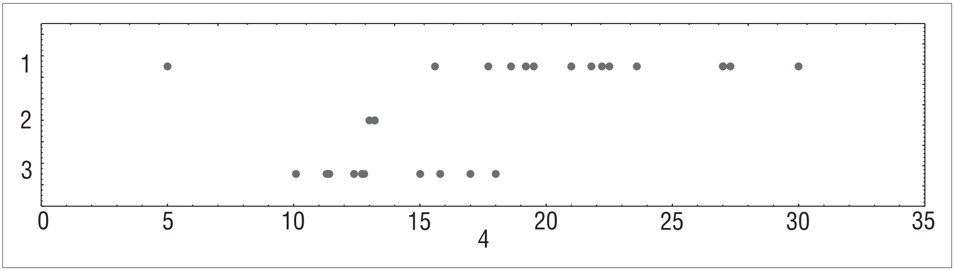
1. URT capacity (passengers/h-1) – morning peak: a. below 1000; b. 1000-2000; c. 2000-4000; d. 4000-6000; e. 6000-10000; f. 10000 (metro)

1. zdolność przewozowa sieci MTS (pas/h-1) – w czasie szczytu porannego: a. poniżej 1000; b. 1000-2000; c. 2000-4000; d. 4000-6000; e. 6000-10000; f. 10000 (metro)

Fig. 3. URT capacity in Warsaw and Gorzów Wielkopolski

Ryc. 3 Zdolność przewozowa sieci MTS w Warszawie i w Gorzowie Wielkopolskim

Source: Kołoś A. 2001, pp. 95, 100.



1. separate tracks, 2. partly separate tracks (pavement-top kerbs), 3. tram-on-street, 4. minimum operating speed (kmh^{-1}). Dots mark route stretches with single track type.

1. torowisko wydzielone, 2. torowisko wydzielone częściowo (za pomocą krawężników), 3. torowisko w jezdni, 4. prędkość komunikacyjna minimalna (w kmh^{-1}). Kropki oznaczają poszczególne, jednorodne odcinki tras.

Fig. 4. Street/separate tracks versus operating speed in Cracow

Ryc. 4. Zależność pomiędzy typem torowiska a prędkością komunikacyjną minimalną w Krakowie

Source: own study based on Cracow public transport company MPK S.A., processed with ® Statistica 5.

of the new underground system, which was first designed in 1970s, but stretches of which are only now being opened.

The separated tram-tracks dominated in peripheral neighbourhoods. While in several city centres tracks were separated form the streets (often at a large scale, such as in Warsaw, Szczecin and Gdańsk), the spatial extent of this development was still insufficient for a modern URT. Several cities still had too many tracks set into the streets (e.g. Cracow, Łódź and Wrocław), especially in their centres, which may potentially lead to a deterioration of these systems.

Photos by A. Kołoś

Fig. 5. ul. Grzegórzecka in Cracow. (a) prior to retrofit in 1999; and (b) following kerb separation of tram tracks/bus lane in 2000

Ryc. 5. ul. Grzegórzecka w Krakowie: w roku 1999: (a) przed modernizacją i (b) po wydzieleniu w roku 2000 pasa dla transportu publicznego za pomocą krawężników

Tab. 5. Operating speed and proportion of separate tracks in total network

Tab. 5. Prędkość komunikacyjna i stopień wydzielenia torowisk MTS w miastach (zespołach miast) w Polsce

City/town		Mean operating speed* weighted by line length (km / h)	Proportion of separated tracks (perc.) 1993	Notes
Grudziądz	Population	19.2	52,9 [a]	Numerous single-track lines
Gorzów Wlkp.		24.2	72,4	
Elbląg		15.5	83,7	Numerous single-track lines
Toruń		21.0	89,2	
Częstochowa		20.8	100,0	
Bydgoszcz		21.2	83,8	
Szczecin		17.6	63,2	
Poznań		18.9	64,6	
Wrocław		16.8	53,6	
Cracow		17.8	73,3	
Trójmiasto		22.1	85,6 [a]	
Łódź		18.2	70,7	
Warsaw		19.0	80,1	
GOP		19.1	77,9	Numerous single-track lines
Mean		Lower < 19,4 < higher	l < 75.1 < h	

* attempt was made to consider minimum (congestion) speeds, but was not always possible. In Grudziądz, Toruń, Bydgoszcz, Szczecin and in Upper Silesia mean travel times were used, and in Gorzów the shortest times. Still, in smaller towns, mean times are also the maximum times, e.g. in Grudziądz and Toruń, where the author conducted appropriate measurements.

a – 1998.

Source: own study based on various data (Kołoś A. 2001) and on *Komunikacja* ... 1994.

Many cities had attempted to solve the problem by partially separating the tram and car traffic. Solutions used included:

– solid lines painted on the street pavement. An inexpensive and easy to execute solution that avoids any major alteration of the physical structure of the street and allows cars to use the track area in an emergency. In Poland, however, the solid line is notoriously disregarded by drivers, particularly during peak and congestion hours;
– kerbs (Fig. 5), barriers or level difference between the street and the track. Such solutions are effective in enforcing traffic code, but restrict emergency traffic;
– "wrong way" tram traffic in one way streets;
– total car traffic ban in "pedestrian-and-tram" streets.

5. Conclusion

There are a number of conclusions to be drawn from the research:

I. Accessibility of URT in Poland depends on the size of the city. It tends to be better in larger cities and particularly in the city-centres. Insufficient passenger flows are a significant barrier to URT in smaller towns. In all cities, there are non-served areas, typically developed after 1970, that would justify the use of URT. On the other hand, URT service is provided, partly unjustifiably, in certain urban areas that used to be densely populated and/or had large numbers of jobs. This is a result of differences between urban development and that of URT during late 20^{th} c.

II. There are many lines with capacity below 2000 and even 1000 passengers per hour attesting to their under utilisation. On the other hand, there were certain lines (in Warsaw, Cracow and Poznań) where capacities exceeded 6000 passengers and nearly reaching the technical ceilings.

III. One of the crucial problems of Polish tram transport is its low operating speed caused by the intersection of the tram and car traffic flows, particularly in city centres. This is a result of the tram networks still following 19^{th} c. patterns, despite modernisation attempts.

IV. Issues of note include the under-utilisation of the fast urban railway systems in Gdańsk-Sopot-Gdynia (SKM) and Warsaw (WKD). Operated by the national railway enterprise, PKP, the two systems have been suffering from the mother organisation's internal problems, although the latter's restructuring that began in 2001 does give some hope of improvement.

V. The Upper Silesian URT is characterised by a great spatial extent, very low service frequency, low capacity and low operating speed. This is attributable to its under-investment, still-visible differences between the three originally separate networks (Bytom, Katowice, Dąbrowa Górnicza) and even older disparities along the former national borders (especially the Prussian-Russian border). Considering this the tram transport system is hardly making an impact on the functioning of the Katowice conurbation, and is providing even less of an integrating contribution. Combined with a very limited role of the national railway system within the conurbation the local URT can be seen as making no impact in this area whatsoever. This is particularly acute in an area, which because of its size, function and environmental pressures calls for an efficient URT.

References:

130 lat statystyki Warszawy, 1994, WUS, Warszawa.

Kołoś A., 2001, *Rozwój i funkcjonowanie miejskiego transportu szynowego w Polsce*, maszynopis rozprawy doktorskiej w Archiwum IGiGP UJ, Kraków.

Kompleksowe badania ruchu w Katowicach i Siemianowicach Śląskich, 1999, [w:] W. Starowicz, A. Rudnicki, R. Janecki (red.), Zesz. Nauk.-Techn. o/SITK w Krakowie, (6) 73.

Komunikacja Miejska w liczbach. Dane za 1993 rok, 1994, 4/93, IGKM, Warszawa.

Komunikacja Miejska w liczbach. Dane za 3 miesiące 2000 roku, 2000, 1/00, IGKM, Warszawa.

Metody oceny i kontroli funkcjonowania komunikacji zbiorowej 1996, Zesz. Nauk.-Techn. o/SITK w Krakowie, (15) 50.

Meyer B., 1998, *Społeczno- ekonomiczne uwarunkowania rozwoju transportu w aglomeracji Szczecina*, Wyd. Uniw. Szczecińskiego, Szczecin.

Podoski J., 1985, *Transport w miastach*, WKiŁ, Warszawa.

Pucher J., 1998, *Urban transport in Germany: providing feasible alternatives to the car*, Transport Reviews, 18, 4, 285-310.

Rocznik Statystyczny Gdańska, 2000, V, US, Gdańsk.

Rocznik Statystyczny Krakowa, 2000, XV, US, Kraków.

Rocznik Statystyczny Miasta Poznania, 1995, XIII, WUS, Poznań.

Rocznik Statystyczny Miasta Szczecina, 1999, VI, US, Szczecin.

Rocznik Statystyczny Miasta Wrocławia, 1986, I, WUS, Wrocław.

Rocznik Statystyczny Poznania, 1999, US, Poznań.

Rocznik Statystyczny Warszawy, 1998, US, Warszawa.

Rocznik Statystyczny Województw, 2000, GUS, Warszawa.

Rocznik Statystyczny Wrocławia, 2000, US, Wrocław.

Rozkwitalska C., 1997, *Koszty i korzyści transportu zbiorowego i indywidualnego w miastach*, IGPiK, Warszawa.

Rucińska D., 1997, *Popyt na usługi transportowe,* [w:] W. Rydzykowski, K.Wojewódzka- Król (red.), *Transport*, PWN, Warszawa.

Rudnicki A., 1994, *Obsługa komunikacyjna w obszarach zurbanizowanych w Polsce*, Zesz. Nauk. -Techn. o/SITK w Krakowie, (1) 30.

Rudnicki A., 1999, *Jakość komunikacji miejskiej*, Zesz. Nauk.-Techn. o/SITK w Krakowie, (5) 71.

Statystyka Łodzi, 2000, US, Łódź.

Wyszomirski O., 1998, *Funkcjonowanie rynku komunikacji miejskiej*, Wyd. Uniw. Gdańskiego.

Funkcjonowanie miejskiego transportu szynowego jako element jakości życia w miastach

Streszczenie

Celem artykułu jest analiza warunków funkcjonowania MTS w Polsce w kontekście ich wpływu na jakość życia mieszkańców. Objęto nią wszystkie miasta posiadające ten rodzaj transportu w Polsce. Wspomniane warunki (dostępność do tras MTS, wykorzystanie sieci MTS, częstotliwość kursowania i zdolność przewozowa oraz prędkość komunikacyjna pojazdów MTS) w istotny sposób wpływają na standard i jakość życia mieszkańców miast. Wynika to z faktu, iż w warunkach polskich nadal ponad połowa podróży w miastach realizowana jest przy pomocy transportu publicznego.

Dostępność do sieci MTS w miastach polskich zależała od wielkości miasta. Była ona bowiem lepsza w miastach większych, a zwłaszcza w ich obszarach śródmiejskich. Należy jednak zwrócić uwagę, iż w mniejszych miastach istotnym ograniczeniem stosowania MTS był brak odpowiednio dużych potoków przewozowych. We wszystkich badanych ośrodkach istniały duże osiedla lub dzielnice, zbudowane najczęściej po 1970 r., pozbawione MTS, mimo iż byłby on tam przydatny. Z drugiej strony MTS obsługiwał (częściowo niepotrzebnie) obszary miast, które niegdyś charakteryzowały się dużą gęstością zaludnienia i dużą liczbą miejsc pracy.

Na wielu trasach zdolność przewozowa spadała poniżej 2000 pasażerów na godzinę, a nawet poniżej 1000, co świadczyło o słabym ich wykorzystaniu. Z drugiej strony, na kilku trasach (w Warszawie, Krakowie i Poznaniu) zanotowano zdolności przekraczające 6000 pasażerów, tj. zbliżające się do maksymalnej z technicznego punktu widzenia.

Jednym z największych problemów funkcjonowania transportu tramwajowego w Polsce była niska prędkość komunikacyjna, spowodowana przez kolizyjność ruchu tramwajowego i samochodowego w miastach Polski, zwłaszcza w ich centrach. Był to wynik funkcjonowania części sieci komunikacji tramwajowej, mimo podejmowanych działań modernizacyjnych, według XIX-wiecznych rozwiązań.

Należy zwrócić uwagę na słabe wykorzystanie SKM w Trójmieście oraz WKD w aglomeracji warszawskiej. Wynika to przede wszystkim z wewnętrznych problemów PKP, i można mieć nadzieję, że sytuacja poprawi się po rozpoczętej w 2001 roku restrukturyzacji tego systemu.

System MTS na Górnym Śląsku i w Zagłębiu, mimo swej rozległości, cechował się bardzo niskimi częstotliwościami, małą zdolnością przewozową i niską prędkością komunikacyjną. Wynikało to z stosunkowo niewielkiej skali jego modernizacji; powstania z połączenia kilku systemów, nie do końca spójnych (sieci bytomska, katowicka, dąbrowska) oraz nie przezwyciężonych do końca podziałów granicznych (zwłaszcza granicy prusko – rosyjskiej). W tej sytuacji trudno mówić o istotnym wpływie komunikacji tramwajowej na funkcjonowanie konurbacji katowickiej, a zwłaszcza o jego roli integrującej (ze względu na niewielką rolę PKP w przewozach wewnątrz konurbacji należy tu mówić o braku wpływu MTS). Jest to szczególnie niewłaściwie w obszarze, który z racji swej wielkości, funkcji oraz zagrożeń ekologicznych jest predestynowany do posiadania sprawnego MTS.

Arkadiusz Kołoś
Institute of Geography and Spatial Management
Jagiellonian University
Cracow

Translated by Paweł Pilch